

the male, a future female could not be used for this purpose though it will undoubtedly be the better for more accurate, ultimate determination of relationships of this species.

In some respects *Z. eiseni* is intermediate between *Apatolestes* and *Silvius*. The writer was inclined to place the published species as a sub-genus under *Silvius*. Study of this specimen even though damaged enables corroboration of Townsend's earlier opinion that it is distinct on a generic level.

SUMMARY

Zophina new genus is proposed for *Apatolestes* (?) *eiseni* Townsend, genotype species from Lower California. Comment is made on Townsend's published and unpublished notes on this species.

REFERENCE

TOWNSEND, C. H. T.

1895. On the Diptera of Baja California, including some species from adjacent regions. Proceedings of the California Academy of Sciences, Ser. 2, 4:593-620.

MIROLEPISMA DESERTICOLA SILVESTRI, A MYRMECOPHILE FROM CALIFORNIA

(Thysanura: Lepismatidae)

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Mirolepisma deserticola was described by Silvestri in 1938 from a single specimen collected in Tucson, Arizona in 1908. Since that time, no mention has been made of its biology or of its occurrence in California. Mallis (1941), however, did mention that he had observed Thysanura running in and out of the nest of the harvester ant, *Pogonomyrmex barbatus* var. *nigrescens*, near Riverside, California. He evidently did not collect or attempt to identify the species of Thysanura.

In 1950 W. F. Barr, now of the University of Idaho, while collecting beetles in the vicinity of Winnemucca, Nevada, found two female *Mirolepisma* in the nest of harvester ants. This discovery led the writer to search the desert areas of California and Nevada

¹ All species of ants were identified by M. R. Smith of the United States National Museum.

for additional material. The locality records of *M. deserticola* and the ants¹ with which it was found are listed below:

POGONOMYRMEX OCCIDENTALIS OCCIDENTALIS (Cresson)

NEVADA: Winnemucca, 26 April 1950 (W. F. Barr), 2 ♀ ♀.

POGONOMYRMEX CALIFORNICUS ESTEBANIUS (Pergande)

CALIFORNIA: 6 mi. W. of Indio, Riverside County, 5 April 1951 (J. W. MacSwain), 2 ♂ ♂, 5 ♀ ♀; Palm Springs Station, Riverside County, 20 April 1951 (W. J. Wall, R. C. Bechtel, E. I. Schlinger and E. J. Taylor), ♂ ♂, ♀ ♀; Sheep Hole Mts. (summit), San Bernardino County, 30 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀; Bagdad, San Bernardino County, 30 March 1952 (R. C. B. and E. I. S.) ♂ ♂, ♀ ♀.

POGONOMYRMEX CALIFORNICUS (Buckley), s. lat.

CALIFORNIA: Whitewater, Riverside County, 28 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀.

MYRMECOCYSTUS SEMIRUFA (Emery)

CALIFORNIA: 6 mi. W. of Indio, Riverside County, 5 April 1951 (J. W. MacSwain), 1 ♀.

VEROMESSOR PERGANDEI (Mayr)

CALIFORNIA: Palm Springs, Riverside County, 21 April 1951 (W. J. W. and R. C. B.), 1 ♂, 1 ♀; Whitewater, Riverside County, 28 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀; Bagdad, San Bernardino County, 30 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀; 29 Palms, San Bernardino County, 30 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀; Sheep Hole Mts. (summit), San Bernardino County, 30 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀; Rand, Kern County, 31 March 1952 (R. C. B. and E. I. S.), ♂ ♂, ♀ ♀².

SOLENOPSIS sp.

CALIFORNIA: Cabazon, Riverside County, 20 April 1951 (W. J. W. and R. C. B.), 1 ♀³. Magnesia Canyon, Riverside County, 21 April 1951 (W. J. W. and E. I. S.), 1 ♀.

MISCELLANEOUS RECORDS

CALIFORNIA: N.W. of Barstow, San Bernardino County, October 1928; Salton Sea Beach, Imperial County, 22 April 1951 (W. J. W. and R. C. B.), 1 ♂, 1 ♀ (ants not identified); 1 mi. S. of Desert Beach, Imperial County, 10 April 1952 (W. H. Lange), 1 ♀ [with *Thermobia domestica* (Packard)].

The species of ants with which *Mirolepisma* was found are in general desert forms. According to Creighton (1950) and Mallis (1941) *P. occidentalis*, *P. californicus*, and *P. californicus estebanius* are found in the desert areas of Arizona and Southern California. The range of *P. occidentalis* extends northward into Nevada and eastward to New Mexico, while *P. californicus* is also found in Texas and Mexico.

M. deserticola is well adapted to life in sandy areas. Its legs are armed with stout spines and when individuals are exposed to the

² Crickets of the genus *Myrmecophila* were also found in this nest of ants.

³ Several *Reticulitermes hesperus* Banks were also present.

light, they will dig rapidly until completely buried. The exact relationship between the ants and silverfish has not been definitely established, but it was noted that the *Mirolepisma* carefully avoided contact with the ants. This observation led the writer to conclude that a commensal relationship exists between the two groups.

In order to ascertain the food habits of *M. deserticola*, a number of silverfish were taken alive and reared in a controlled temperature cabinet in the laboratory at Davis. The temperature employed was 25 degrees C. \pm 1 and the relative humidity was 75 percent \pm 3. No water was given directly to the insects; the food was dry whole wheat flour. Over a period of 14 months, the culture thrived and hundreds of ova and nymphs were produced from the original group of some 40 adults.

Since no detrimental results were incurred when the silverfish were separated from their hosts, it is believed that *M. deserticola* obtains its food from the products stored by the ants rather than any secretion or regurgitated fluid from the body of the ants.

According to Creighton (1950), Mallis (1941) and Wheeler (1926), *Pogonomyrmex occidentalis*, *P. californicus*, *P. californicus estebanius*, *Veromessor pergandei*, and some species of *Solenopsis* are seed collectors. The feeding habits of *Myrmecocystus semirufa* appear to be uncertain. Creighton (1950) claims that repletes are used to store honey, but that the bodies of other insects are also collected and stored. Mallis (1941) showed that in one instance in Southern California this species attended aphids, apparently for secretions of honey dew.

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